

Measuring Empathy in Dentists and Dental Specialists Using the Jefferson Scale of Physician Empathy – Health Professions Version

by

Amanda Elizabeth Gerlach

B.S. in Business and Life Sciences, Juniata College, 2011

D.M.D., Midwestern University-College of Dental Medicine Arizona, 2016

Submitted to the Graduate Faculty of
the School of Dental Medicine in partial fulfillment
of the requirements for the degree of
Master of Dental Science

University of Pittsburgh

2019

UNIVERSITY OF PITTSBURGH
SCHOOL OF DENTAL MEDICINE

This thesis/dissertation was presented

by

Amanda Elizabeth Gerlach

It was defended on

June 4, 2019

and approved by

Dr. Deborah Polk, Assistant Professor, Department of Public Health

Dr. Nilesh Shah, Assistant Professor, Department of Public Health

Thesis Advisor/Dissertation Director: Dr. Joseph FA Petrone, Assistant Professor and Director,
Department of Orthodontics and Dentofacial Orthopedics

Copyright © by Amanda Elizabeth Gerlach

2019

Measuring Empathy in Dentists and Dental Specialists Using the Jefferson Scale of Physician Empathy – Health Professions Version

Amanda Elizabeth Gerlach, DMD, MDS

University of Pittsburgh, 2019

In the health care setting, empathy can be defined as the ability to understand a patient's experiences and feelings, as well as the ability to communicate this understanding. Empathy has been shown to play an important role in the dentist-patient relationship by improving treatment outcome and increasing patient satisfaction. Recently, a growing concern has developed over a potential decline in empathy among health care providers. **PURPOSE:** This cross-sectional study was designed to investigate the differences in empathy among dentists of different genders, ages, specialties and professional affiliations. **METHODS:** Three hundred forty dentists in western Pennsylvania completed the Jefferson Scale of Physician Empathy-Health Professions Version (JSPE – HP version). Independent t-tests and one-way analysis of variance were used to determine significance of associations between empathy and gender, age, specialty and professional affiliation. **RESULTS:** Empathy scores among female dentists were significantly higher than empathy scores among male dentists ($p < 0.0066$). Empathy scores did not change significantly, however, with increasing age ($p < 0.9670$). Significant differences were also not seen between dentists of “patient- or people-oriented” and “procedure- or technology-oriented” specialties ($p < 0.6298$) or between members of the Dental Society of Western Pennsylvania (DSWP) and the Western Pennsylvania section of the American College of Dentists (ACD) ($p < 0.4602$). **CONCLUSIONS:** It can be concluded that, in agreement with existing research, female dentists are more empathic than male dentists. There is no relationship between empathy and age, specialty,

or membership in a professional association. The need for further research involving larger sample populations and multiple centers, and the need for methods to improve empathy are discussed.

Table of Contents

1.0 Review of the Literature.....	1
1.1 Empathy	1
1.2 Gender	3
1.3 Age	5
1.4 Specialty.....	8
1.5 Professional Association.....	10
2.0 Purpose of the Present Study	12
3.0 Materials and Methods.....	13
4.0 Results	15
5.0 Discussion.....	18
6.0 Conclusions.....	22
Appendix A - Cover Letter	23
Bibliography	24

List of Tables

Table 1. Descriptive statistics of JSPE-HP Version scores from survey participants	15
Table 2. Descriptive statistics of JSPE-HP Version scores from survey participants grouped by gender.....	15
Table 3. Descriptive statistics of JSPE-HP Version scores from survey participants grouped by age	16
Table 4. Descriptive statistics of JSPE-HP Version scores from survey participants grouped by specialty	16
Table 5. Descriptive statistics of JSPE-HP Version scores from survey participants grouped by professional association membership	17

List of Figures

Figure 1. Patient- or people-oriented specialties vs. procedure- or technology-oriented specialties	
.....	14

1.0 Review of the Literature

1.1 Empathy

Empathy is the cornerstone of every doctor–patient relationship, and its role in effective communication and understanding is receiving increasing attention in both general dentistry and dental specialties (Chen et al. 2007). In general, empathy involves attempting to understand another person’s feelings and experiences and the ability to use this understanding to help others solve their own problems (Sherman & Cramer 2005). In the health care setting, empathy can be described as a cognitive and behavioral attribute that involves the ability to recognize how a patient’s experiences and feelings influence and are influenced by their symptoms and illness and the capability to convey this understanding back to the patient, allowing the patient to feel respected and validated (Sherman & Cramer 2005; Chen et al. 2007).

Empathy has been described as involving two domains – a cognitive domain and an affective or emotional domain. The cognitive domain involves the ability to understand another person’s inner experiences and feelings and the capability to view the outside world from the other person’s perspective. The affective domain involves the capacity to enter into or join the experiences and feelings of another person. Conceptually speaking, however, the affective aspect may be more relevant to sympathy (Hojat et al. 2002a).

Although the concepts of empathy and sympathy are often thought to be interchangeable, they should be distinguished in patient-care situations. Empathy has been described as objective compassion, while sympathy involves a more affective response to a patient’s situation. Both concepts involve sharing, however, empathetic physicians share only their understanding.

Sympathetic practitioners share their emotions with their patients, which could interfere with an objective diagnosis and care (Sherman & Cramer 2005; Hojat et al. 2002a).

Empathy in a health care setting has been found to promote patient and physician satisfaction, contribute to patient enabling and participation, and improve patient outcomes (Chen et al. 2007). For example, demonstrations of empathy in dentistry can decrease dental fears, improve treatment outcome in patients with myofascial pain, increase adherence to orthodontic treatment, and increase patient satisfaction with emergency dental care, orthodontic treatment, extractions, restorations and endodontic treatments (Sherman & Cramer 2005). Additionally, empathy can improve the quality of data obtained from the patient, improve the provider's diagnostic ability, and decrease the rate of miscommunication and lawsuits (Chen et al. 2007).

Over the past few decades, leaders in the health professions and health professional education have begun to appreciate the importance of empathy and interpersonal skills in healthcare (Nash 2010). There is also a growing concern among medical and dental educators that clinical training may have an adverse effect on resident and student empathy (Chen et al. 2007). Thus, a renewed emphasis on the importance of professional ethics has led to curriculum changes in medical and dental education (Nash 2010). Currently, the Association of American Medical Colleges (AAMC) recommends that medical schools educate students to “be compassionate and empathetic in caring for patients, demonstrate understanding of the patient's perspective, understand the meaning of patients' stories in the context of their families and cultures, and avoid being judgmental even when patient beliefs and values conflict with their own.” Further, the United States Medical Licensing Examination (USMLE) tests examinees on verbal and nonverbal communication skills demonstrative of empathy. Similarly, providing empathic care for all patients is listed as the second clinical competency for dental education by the American Dental Education Association (ADEA). As a result, many

medical and dental schools acknowledge the importance of empathy in the doctor-patient relationship and have implemented training in interpersonal skills including empathy, active listening and verbal and nonverbal communications (Sherman & Cramer 2005).

Measurement of these skills and effectiveness of various training methods presents a challenge, and the lack of research has been attributed to the lack of adequate self-report measures. The gold standard for measuring of empathy and interpersonal skills is behavioral observation by trained observers. This method, however, can be problematic due to time and cost. Several self-report instruments do exist for examining empathy in the general population. These measures include the Interpersonal Reactivity Index (IRI) developed by Davis (1983), the Hogan Empathy Scale (1969), and the Emotional Empathy Scale developed by Mehrabian and Epstein (1972). The Jefferson Scale of Physician Empathy (JSPE), however, is the only one intended for use in healthcare. It has been found to be a reliable and validated measure in a variety of health care settings (Hojat et al. 2002a; Sherman & Cramer 2005).

1.2 Gender

In general, some have suggested that women's behavioral style is more empathic than men (Baron-Cohen 2003). In fact, in a majority of studies, female health professionals obtained significantly higher JSPE mean scores than their male counterparts (Hojat et al. 2001, 2002a, 2002b, 2002c; Alcorta-Garza et al. 2005; Fjortoft, Van Winkle, & Hojat 2011). This pattern of gender difference in the JSPE scores, with women consistently scoring higher than men, has also been reported in national and international studies (Hojat et al. 2018). In a study of first through fourth year dental students at the University of Washington, females

scored significantly higher on the JSPE than males (Sherman & Cramer 2005). Aggarwal et al. reported similar results when studying dental students at two dental schools in India (Aggarwal et al. 2016). These findings suggest that female dental clinicians may provide a different type of dental care based on a greater ability to empathize with the patient's experiences and feelings (Sherman & Cramer 2005).

There are several plausible explanations that have been offered for gender differences in empathy including social learning, genetic predisposition, evolutionary underpinnings, and other factors (Hojat 2016). For example, it has been suggested that women are more perceptive to emotional signals than men, possessing qualities that can contribute to a better understanding and, ultimately, to a more empathic connection (Hojat et al. 2002a; Hojat 2016). Unlike men, women are also culturally and socially encouraged to develop their empathic skills in different ways (Bailey 2001), and also are more likely to perceive themselves in the context of relationships (Gilligan 1982).

On the basis of the evolutionary theory of parental investment, it is believed that women develop more caregiving attitudes toward their offspring than men (Hojat 2016). The mother-child relationship is thought to form the basis for differences in empathy between women and men, and this relationship model continues in healthcare practice (Bailey 2001). Findings on gender differences in empathy are consistent with the reports that female physicians spend more time with their patients, have fewer patients, render more preventive and patient-oriented care and exhibit more caring attitudes than male physicians (Hojat 2016; Hojat et al. 2002a).

1.3 Age

The relationship that exists between empathy and age in health professionals has been inconsistent when studied. For example, younger nurses and physicians both expressed more empathy toward their patients than older nurses and physicians. Similarly, in another study, younger Iranian medical students scored higher on the JSPE than their older classmates. Conversely, several studies using the JSPE demonstrated either a direct relationship or no significant association between empathy and age among health professions students (Hojat 2016).

Various aspects of medical education and training may contribute to the erosion of empathy among medical students, residents and practicing physicians. Lack of role models, long work-hours and sleep deprivation, a high volume of materials to learn, time pressure, an intimidating educational environment, negative educational experiences and the perception of “belittlement and harassment” in medical school have also been described as factors contributing to the atrophy of compassion among physicians-in-training (Chen et al. 2007; Hojat et al. 2009). Additionally, changes in the market-driven health care system have affected the way healthcare providers are educated. Modern medical education promotes a focus on evidence-based care and clinical trials, a dependence on technology for diagnoses, shorter patient hospitalizations and limited bedside interactions (Hojat et al. 2009).

Regarding the timing of this decline and its correlation to the start of clinical training, it may be that increased technical demands during intensive clinical training exhaust student resources, sacrificing less essential skills and time-consuming behaviors such as compassion for the patient. Students who are completing the clinical portion of their training are also nearing graduation and may place greater importance on their own needs, such as the completion of procedures, than on the needs of their patients. In dental schools, the requirement-driven structure

of many programs may encourage students to be procedurally focused as opposed to focusing on the patient (Sherman & Cramer 2005).

Another possible explanation for this observed decline in empathy might be due to the wide range of emotions experienced by both medical and dental students, making it difficult to maintain empathy. Chen et al. (2007) suggest that in order to “remain effective for patients, students and trainees become less empathic as they face emotionally challenging and draining situations.” Sherman and Cramer (2005) describe the lack of empathy as “a defense that accompanies fear and insecurity when novice health care practitioners must first interact with patients.”

Evidence suggests the empathy can improve from targeted training in healthcare professionals. The timing of one’s course of education to promote empathy and improve communication skills may in fact facilitate the observed decline. Typically courses focusing on behavioral sciences are taken during the beginning of one’s dental education. In the later years, this focus is reduced and courses emphasizing technical skills predominate (Sherman & Cramer 2005).

Because age and experience are so highly interrelated, the effects of experience, as such, can also be examined (DiLalla, Hull, & Dorsey 2008). In fact, a continually growing body of literature exists that suggests an erosion of empathy in medical students as they progress through training (Newton et al. 2000; Bellini, Baime & Shea, 2002; Hojat et al. 2003, 2004; Bellini & Shea, 2005; Rosen et al 2006). In a cross-sectional study, Chen and colleagues (2007) noticed a decline in empathy scores measured by the JSPE in third-year medical students as compared to second-year medical students. Dental students are victims of this phenomenon as well. In another cross-sectional study with dental school students, Sherman and Cramer (2005) reported a significant decline in empathy in second-year students, with the lowest scores as measured by the JSPE

occurring in fourth-year dental students. The timing of the decline in empathy levels corresponded to increases in patient exposure, consistent with reports from medical schools. A more recent cross-sectional study utilizing the JSPE with dental school students reported a statistically significant decrease in empathy from first year students to postgraduate students, as well as a statistically significant decrease in empathy from younger to older dental students (Aggarwal et al. 2016).

Similar declines in empathy have been demonstrated among medical residents. Several longitudinal cohort studies of internal medicine residents showed significant decreases in empathy during training, as measured by the IRI (Bellini, Baime & Shea, 2002; Bellini & Shea, 2005; Rosen et al. 2006). Using the JSPE-Physician Version, a cross-sectional study of internal medicine residents observed that first-year residents scored an average of 4 points higher than third-year residents (Mangione et al. 2002).

A 2009 study measuring the relationships between empathy, spirituality and wellness in medical students and physicians provides the only evidence of a potential recovery in empathy following the decline seen during clinical training. In the cross-sectional study, DiLalla, Hull, and Dorsey reported that first-year students scored significantly higher in empathy than fourth-year students and residents, but that physicians holding faculty positions had greater empathy than residents. Interestingly, these researchers also found that the graduated physicians who did not participate in teaching did not experience the same increase in empathy (DiLalla, Hull, & Dorsey 2008). Yarascavitch and colleagues showed a plateau in emotional empathy among dentists up to 10 years following graduation. However, the anticipated decline was seen in cognitive empathy following graduation among the same dentists (Yarascavitch et al. 2009).

1.4 Specialty

A number of factors have been identified as contributors to a medical or dental student's choice of specialty. Some of these factors include personal traits, educational experiences, role models, influence by family, friends and others, market forces, and societal demands. These factors can contribute either individually or synergistically to the choice. Another factor that has been studied by several researchers is the student's empathy (Hojat et al. 2005).

Although empathy is essential to every doctor-patient relationship, there are some specialties that better lend themselves to developing long-term relationships with patients because of the frequency of encounters, broader consultations, and the provision of continuous care, and therefore, require a higher degree of empathic engagement. Based on this, it is common for health professions education researchers to classify medical specialties into two broad categories of "patient- or people-oriented" (e.g., primary care specialties such as family medicine, general internal medicine, pediatrics), and "procedure- or technology-oriented" (e.g., pathology, radiology, anesthesiology, surgery and surgical subspecialties) (Hojat et al. 2001, 2002a, 2002b; Lieu, Schroeder, & Altman 1989). A "patient- or people-oriented" specialty is defined as one that requires a long-term patient-doctor relationship with continuous care. According to Hojat, this relationship typically "begins with an office-based first encounter health or illness appraisal, preventive education or intervention, episodic and long-term comprehensive care of a wide variety of medical problems." It is probable that the doctor will become familiar with the patient's illness within a psychosocial context, which may include an understanding of the patient's work life, home life, education, support system and personal views on health and illness (Hojat et al. 2005). A "procedure- or technology-oriented" specialty can be defined as one where patient contact is relatively limited and brief, and long-term continuous care is not often required. They primarily

focus on performing specialized diagnostic or technical computer-based procedures and invasive surgical procedures. They may also include specialties that require performing highly skilled and specialized therapeutic techniques or procedures (e.g., surgical subspecialties), or providing episodic or long-term care of a limited number of medical problems that may include instrumentation and technical interventions with a mix of ambulatory and hospital based practice (e.g., medical subspecialties such as interventional cardiology, gastroenterology, plus other nonprimary care specialties) (Hojat et al. 2005). These specialties do not necessarily require knowledge of patients beyond their illnesses, however, some of these specialists choose to gain a greater understanding of their patients' lives, especially the patients with chronic conditions (Bailey 2001). Similarly, dental specialties can be grouped into these two categories. "Patient- or people-oriented" specialties include general dentistry, pediatric dentistry, and orthodontics, while "procedure- or technology-oriented" specialties include endodontics, periodontics, prosthodontics, oral and maxillofacial surgery, oral pathology, oral radiology, and dental anesthesiology.

In a 2001 study, Bailey found that medical students who planned to pursue a career in patient-oriented specialties scored significantly higher on empathy as measured by the IRI than their peers who planned to pursue careers in procedure-oriented specialties. Given Bailey's previous findings, it can be hypothesized that high scorers on the JSPE are more likely to choose "patient- or people-oriented" specialties that require continuous and prolonged encounters with patients. Conversely, it can be hypothesized that low scorers on the JSPE would be more probable to choose "procedure- or technology-oriented" specialties that often require less interaction with patients and involve diagnostic or therapeutic procedures. These hypotheses have been confirmed in a number of studies. For example, in a study of 1,007 physicians affiliated with the Jefferson Hospital Network in Philadelphia, PA, the physicians in "patient- or people-oriented" specialties

scored higher on the JSPE compared to others in “technology- or procedure-oriented” specialties (Hojat et al. 2002a). This is consistent with findings reported by others in the United States and internationally (Chen et al. 2007, 2012; Voinescu, Szentagotai, & Coogan 2009; Kataoka et al. 2012). In one study of osteopathic medical students, however, the aforementioned associations between specialty interests and JSPE scores were not observed (Calabrese et al. 2013).

These significant differences in empathy scores observed among both medical students and practicing physicians in various specialties may also demonstrate the idea that individuals with different degrees of interpersonal skills are attracted to different specialties. Additionally, these differences have also been thought to result from the amount of emphasis placed on interpersonal skills training in different specialties (Hojat 2002b).

1.5 Professional Association

The two groups surveyed for this study were the Dental Society of Western Pennsylvania (DSWP) and the Western Pennsylvania Section of the American College of Dentists (ACD). The ACD is the oldest major honorary organization for dentists. Since its founding in 1920, the ACD has come to epitomize ethics and professionalism in dentistry. The mission of the ACD is “to advance excellence, ethics, professionalism, and leadership in dentistry,” and its members work continuously to improve the ethical climate of dentistry. Membership in the ACD is by invitation only and consists of approximately 3.5% dentists of the United States. Prospective members are nominated by current members of the college and are selected based on leadership, model ethics and exceptional contributions and service to the profession and to society (American College of Dentists 2007).

The DSWP was founded in 1881 “to encourage the improvement of public health, to advocate the profession of dentistry, and to embody the interests of both the professional members and the public.” Membership is open to all licensed dentists in the geographic area and is part of a tripartite membership in the American Dental Association (ADA), the Pennsylvania Dental Association (PDA), and the DSWP. Membership affords the dentist opportunities to meet fellow dentists, give back to his or her community, and support and protect the profession through advocacy (Dental Society of Western Pennsylvania 2018).

There is little to no existing research examining membership in professional associations with empathy in healthcare professionals or students. The concept of peer nominations, however, has shown an association with empathy in the context of patient care. In several studies of medical students, it was found that the students who were nominated by their peers in areas of clinical and humanistic excellence scored higher on the JSPE compared to their classmates who were not nominated (Hojat 2016).

2.0 Purpose of the Present Study

The purpose of this study is to compare levels of empathy among practicing dentists of different (1) genders, (2) age groups, (3) specialties, and (4) professional associations using the Jefferson Scale of Physician Empathy – Health Professions Version (JSPE-HP Version). Similar to existing research, we hypothesize that (1) females will have higher empathy scores than males, (2) older age groups will have lower empathy scores than younger ages groups, (3) providers in “patient- or people-oriented” specialties that form a long-term relationship with patients, including general dentistry, pediatric dentistry, and orthodontics, will have higher empathy scores than providers in “procedure- or technology-oriented” specialties where a long-term relationship is not typically formed, including endodontics, periodontics, prosthodontics, oral and maxillofacial surgery, oral pathology, oral radiology, and dental anesthesiology, and (4) members of the ACD will have higher empathy scores than members of the DSWP.

3.0 Materials and Methods

This study was a cross-sectional survey of dental practitioners in western Pennsylvania using the Jefferson Scale of Physician Empathy-Health Professions Version (JSPE-HP Version). 870 members of the DSWP and 89 members of the Western Pennsylvania Section of the ACD were surveyed. Any dentist who was a member of both groups was counted solely as a member of the Western Pennsylvania section of the ACD and, therefore, was only mailed one survey. Participants were mailed a paper copy of the JSPE-HP Version. Surveys sent to DSWP members were printed on white paper and surveys sent to ACD members were printed on grey paper for separation purposes on return. Each was accompanied by a signed cover letter to increase cooperation (See Appendix A). The 20 Likert-type items were answered on a 7-point scale (1=strongly disagree, 7=strongly agree). Demographic information was also surveyed, including age, gender and dental specialty. The respondents were instructed not to identify themselves. An addressed, postage-paid envelope was provided for return of the survey. A total of 340 surveys were completed and returned, representing a 35% response rate.

Upon receipt of the completed surveys, the anonymous responses were recorded. There were no personal identifiers attached to the data obtained from the anonymous survey responses. The scoring algorithm provided by Thomas Jefferson University was used to compute the empathy score for each respondent (Jefferson Scale for Empathy Scoring Algorithm). All data was entered into an excel spreadsheet and uploaded into STATA (StataCorp, College Station, TX). Specialties were assigned to either the “patient- or people-oriented” or “procedure- or technology-oriented” category. Figure 1 lists the specialties included in each category.

Patient- or people-oriented	Procedure- or technology-oriented
General Dentistry	Oral and Maxillofacial Surgery
Orthodontics	Endodontics
Pediatric Dentistry	Prosthodontics
	Periodontics
	Other (Dental Anesthesiology, Oral Pathology, Oral and Maxillofacial Radiology, Sleep Dentistry)

Figure 1. Patient- or people-oriented specialties vs. procedure- or technology-oriented specialties

The mean empathy score was calculated for the entire population, as well as each gender, age group, specialty category, and professional association. Two sample independent t-tests were used to examine statistical differences in empathy scores between genders, specialties, and professional associations. A one-way analysis of variance (ANOVA) was also used to assess any statistical differences in empathy scores among age groups. A p-value of less than 0.05 was considered statistically significant. This study protocol was approved by the University of Pittsburgh Institutional Review Board.

4.0 Results

The sample consisted of survey responses from 340 dental practitioners in western Pennsylvania. The mean empathy score for all participants was 115.24, with scores ranging from 72 to 140 (Table 1).

Table 1. Descriptive statistics of JSPE-HP Version scores from survey participants

N	Mean	SD	Min	Max
340	115.24	12.68	72	140

Within the sample, 71 responders (20.88%) were female and 244 responders (71.76%) were male. 35 people (7.35%) did not respond. When comparing females to males, the difference in mean score was significant ($p < 0.05$) (Table 2). As hypothesized, females had higher scores than males.

Table 2. Descriptive statistics of JSPE-HP Version scores from survey participants grouped by gender

Gender	N	Percent	Mean	SD	P-value
Female	71	20.88	119.13	11.48	$<0.0066^*$
Male	244	71.76	114.45	12.99	

* $p < 0.05$

Of the participants, 62 (18.24%) were 50 years old or younger, 71 (20.88%) were between the ages of 51 and 60, 116 (34.12%) were between the ages of 61 and 70, and 86 were over 70 years old (25.29%). Five (1.47%) participants did not provide their age. Within the sample,

participants in their seventh decade of life had the highest mean empathy score. The differences between the four groups, however, were not statistically significant (Table 3).

Table 3. Descriptive statistics of JSPE-HP Version scores from survey participants grouped by age

Age	N	Percent	Mean	SD	P-value
≤50	62	18.24	115.05	11.944444	<0.9670
51-60	71	20.88	114.93	13.172833	
61-70	116	34.12	115.73	11.780192	
>70	86	25.29	114.99	14.212252	

Each specialty can be classified as a “patient- or people-oriented” specialty or a “procedure- or technology-oriented” specialty. The classification of each specialty is shown in Figure 1. Within the sample, 4 (1.18%) participants did not provide their specialty. Of the other 336 participants, 280 (82.35%) identified as “patient- or people-oriented” specialists and 56 (16.47%) identified as “procedure- or technology-oriented” specialists. Although the mean empathy score for the “patient- or people-oriented” specialists was higher, the difference in the mean empathy scores between the two groups was minimal and not statistically significant (Table 4).

Table 4. Descriptive statistics of JSPE-HP Version scores from survey participants grouped by specialty

Specialty	N	Percent	Mean	SD	P-value
Patient	280	82.35	115.35	12.49	<0.6298
Procedure	56	16.47	114.45	13.95	

310 (91.18%) participants were members of the DSWP and 30 (8.82%) were members of the ACD. The mean score for DSWP members was slightly higher than the mean score for ACD members, however, the difference was not significant (Table 5).

Table 5. Descriptive statistics of JSPE-HP Version scores from survey participants grouped by professional association membership

Professional Association	N	Percent	Mean	SD	P-value
DSWP	310	91.18	115.39	12.7	<0.4602
ACD	30	8.82	113.6	12.57	

The population who received the survey consisted of 870 (90.72%) members of the DSWP and 89 (9.28%) members of the ACD. It was determined that there is no statistically significant difference between the distributions of dentists in the western Pennsylvania area and the sample of surveys returned for use in this study (0.772).

5.0 Discussion

Because of its potential impact on aspects of patient care and patient satisfaction, empathy is important to the practice of dentistry. The purpose of this thesis was to investigate differences in self-reported empathy among dental practitioners of different genders, specialties, ages and professional affiliations using the JSPE-HP version. Based on existing research, it was believed that empathy would be greater among females, younger practitioners, practitioners of “patient- or people-oriented” specialties, and members of the Western Pennsylvania Section of the ACD.

As expected, empathy scores among females were significantly higher than empathy scores among males. The results of this study are in agreement with the existing body of literature demonstrating female healthcare providers to be more empathic than their male counterparts (Hojat et al. 2001, 2002a, 2002b, 2018; Alcorta-Garza et al. 2005; Sherman & Cramer 2005; Fjortoft, Van Winkle, & Hojat 2011; Aggarwal et al. 2016). This general consensus that women’s behavioral style is more empathic than men is most commonly explained on the basis of the evolutionary theory of parental investment (Baron-Cohen 2003). Women develop more caregiving attitudes toward their offspring than men, and this mother-child relationship is thought to form the basis for differences in empathy between women and men (Hojat 2016; Bailey 2001). Alternatively, researchers have offered several other plausible explanations for this difference such as genetic predisposition, social learning, and other factors. For example, it has been suggested that women are more perceptive to emotional signals than men, possessing qualities that can contribute to a better understanding and, ultimately, to a better empathetic relationship (Hojat et al. 2002a; Hojat 2016). Unlike men, women are also culturally and socially encouraged to develop

their empathic skills in different ways (Bailey 2001), and also are more likely to perceive themselves in the context of relationships (Gilligan 1982).

Similar to existing studies that demonstrate a decline in empathy in medical students (Newton et al. 2000; Bellini, Baime & Shea 2002; Hojat et al. 2002c, 2004, 2005; Bellini & Shea 2005; Rosen et al. 2006) and dental students (Sherman & Cramer, 2005; Yarascavitch et al. 2009) throughout the training experience, the expectation of this study was that less empathy would be seen among older practitioners. Unexpectedly, no difference (positive or negative) was seen in the mean empathy scores of groups of dentists of increasing ages. This study differed from most previous studies, however, because it surveyed practicing dentists. Interestingly, the scores are similar to empathy scores previously reported for graduating dental students (Sherman & Cramer, 2005; Yarascavitch et al. 2009), suggesting a plateau in empathy that begins with completion of the training period. One theoretical explanation for this plateau is the development of detached concern. Fox (1989) defines detached concern as “the ability of a health care worker to apply objectivity to practice in order to facilitate the execution of duties that would otherwise be hindered by internal or external emotional reactivity.” In clinical situations, the development of detachment is thought to avoid "errors of sympathy" that may interfere with the ability to interact with suffering patients (Halpern 2001). Alternatively, this plateau may be due to an acculturation process in which students acquire a “professional persona” as they enter the health care community (Chen et al. 2007).

Furthermore, while most studies have reported a difference between practitioners of “patient- or people-oriented” specialties and “procedure- or technology-oriented” specialties (Bailey 2001; Hojat et al. 2002; Chen et al. 2007, 2012; Voinescu, Szentagotai, & Coogan 2009; Kataoka et al. 2012), the results of this study are unusual in that empathy was not significantly

different between these two types of specialists. Additionally, comparing empathy of members of the DSWP and the Western Pennsylvania Section of the ACD yielded unexpected results. Empathy was not significantly different between members of the two groups. In both instances, the power of the study was relatively low (.0733 and .1157 respectively, with 1.0 being ideal). Different outcomes may have been reached with more respondents, potentially increasing the power of both comparisons.

With 340 completed surveys in total, our study, however, had more than twice the number of respondents as previous attempts to survey dentists and dental students. Yarascavitch et al. (2009) collected 123 completed surveys (Response Rate = 20.8%) in her survey of Ontario dentists, and Sherman and Cramer (2005) received 130 (Response Rate = 61%) when surveying first through fourth year dental students. Additionally, the demographics of the participants are similar to those of dental practitioners both in the United States and the state of Pennsylvania. According to the American Dental Association Health Policy Institute in 2018, of the 199,486 dentists in the US, 32.3% are female and 21% are specialists. 16.9% of dentists were under age 35, 23.4% were between ages 35 and 44, 21.1% were between ages 45 and 54, 22.8% were between ages 55 and 64, and 15.8% were age 65 and older. Of the 8,474 dentists working in the state of Pennsylvania, 26.5% are female and 21% are specialists. 16.6% of dentists were under age 35, 27.2% were between ages 35 and 49, 37.2% were between ages 50 and 64, and 19.0% were age 65 and older (American Dental Association Health Policy Institute 2018).

There are several limitations of our study. First, our measurement of empathy is self-reported. Although the JSPE-HP version has been shown to be a reliable and valid measure of empathy, it is limited to reflecting dentists' own perceptions of their orientation towards empathy and not actual behaviors. Second, our study was cross-sectional, and cohort effects may account

for observed differences among groups. The population in this study was also limited to dental professionals in western Pennsylvania, and results may not be generalizable to all dentists.

Other limitations of the study may have influenced the response rate. First, the topic of the survey was empathy. Dillman (2000) states that perceived value effects survey response rate. For dentists, empathy may not have been viewed as a pertinent or interesting topic. Dentists may have felt embarrassment or concern about not replying empathically to the survey. Second, this survey did not utilize reminders due to time constraints. The use of pre-notification and reminders has shown to be a significant element in survey response rate. For example, the response rate increased from 22.6% to 39.4% in one study after the reminders were sent (Saleh & Bista 2017). Lastly, survey participation and response may be influenced by when the data was obtained.

Future research should look to eliminate these limitations by utilizing a longitudinal study involving multiple sites and larger samples. Behavioral observation of activities during practitioner and patient interaction in addition to self-report measures would also be a valuable addition to future research on empathy in dental professionals.

6.0 Conclusions

Empathy is important in the dentist–patient relationship and has clear benefits in improving patient satisfaction and treatment outcomes. The purpose of this thesis was to explore differences in empathy among dentists in western Pennsylvania. In agreement with existing research, this study provides evidence that there is a significant difference in empathy among males and females. Contrary to previous research, there is no association between measured empathy and dental specialty, professional association membership, or age. The lack of differences, especially in increasing age, is interesting and suggests that concerns regarding the decline in empathy may be misplaced. Health care practitioners may be trying to fit a professional persona as opposed to losing humanistic qualities. Still, these results cannot yet be applied to all populations with certainty. Future studies should seek to include more participants, longer time periods, and additional demographic variables while focusing on improving empathy during training, as potentially higher levels, once established, would seemingly be maintained throughout the practitioner’s career.

Appendix A - Cover Letter



University of Pittsburgh

School of Dental Medicine
Department of Orthodontics and Dentofacial Orthopedics

Sak Hall
3501 Terrace Street
Pittsburgh, PA 15261-1932
Academic Office: 412-648-8419
Orthodontic Clinic: 412-648-8889
Fax: 412-648-8817

(Month) (Date), (Year)

Dr. (First Name) (Last Name)

(Street Address)

(City), (State) (Zip Code)

Dear Dr. (Last Name):

My name is Dr. Amanda Gerlach and I am a third year orthodontic resident at the University of Pittsburgh School of Dental Medicine. I am conducting a research study in pursuit of a Master of Dental Science degree in cooperation with my research mentor Dr. Joseph Petrone in the School's Department of Orthodontics and Dentofacial Orthopedics.

Our research has been approved by the University of Pittsburgh Institutional Review Board and the purpose of the study is to investigate differences in the way that dentists of different ages and specialties relate to their patients. For that reason, we are surveying dental professionals in Western Pennsylvania and asking them to complete a brief (approximately 5 minute) questionnaire. If you are willing to participate in our study, please complete the enclosed questionnaire that will ask about your background (e.g. age, gender, dental specialty), as well as about your thoughts and feelings as they relate to your patients.

There are no foreseeable risks associated with your participation in this project, nor are there any direct benefits to you. This is an anonymous questionnaire, so your responses will not be identifiable in any way. All responses are confidential and results will be kept under lock and key or in password-protected files. Your participation is voluntary, and you may stop completing and discard the survey at any time.

If you are willing to complete our survey, we ask that you please then return it in the addressed, postage-paid envelope included with this letter by (Deadline). You may contact us by phone at 412-648-8419 or e-mail at aeg55@pitt.edu or jfap@pitt.edu if you have any questions regarding the survey. We truly appreciate your participation in our study.

Sincerely,

Amanda Gerlach, DMD
Third Year Resident

Joseph FA Petrone, DDS, MSD, MPH
Assistant Professor, Program Director and Chair

Bibliography

- Aggarwal, V.P., Garg, R., Goyal, N., Kaur, P., Singhal, S., . . . Singla, N. (2016). Exploring the missing link - empathy among dental students: an institutional cross-sectional survey. *Dent Res J*, 13, 419-23.
- Alcorta-Garza, A., Gonzalez-Guerrero, J.F., Tavitas-Herrera, S.E., Rodriguez-Lara, F.J., Hojat, M. (2005). Validity and reliability of the Jefferson scale of physician empathy in Mexican medical students. *Salud Mental*, 28(5), 57-63.
- American College of Dentists. (2007). About Us. Gaithersburg, MD: American College of Dentists.
- American Dental Association Health Policy Institute. (2018). Supply of Dentists in the U.S.: 2001-2018. Chicago, IL: American Dental Association.
- Bailey, B.A. (2001). Empathy in medical students: assessment and relationship to specialty choice. *Dissertation Abstracts International*, 62(6-A), 2024.
- Baron-Cohen, S. (2003). The essential difference: the truth about the male and female brain. New York: Basic Books.
- Bellini, L.M., Baime, M., Shea, J. (2002). Variation of mood and empathy during internship. *JAMA*, 87(23), 3143-6.
- Bellini, L.M., Shea, J. (2005). Mood change and empathy decline persist during three years of internal medicine training. *Academic Medicine*, 80(2), 164-7.
- Calabrese, L. H., Bianco, J. A., Mann, D., Massello, D., & Hojat, M. (2013). Correlates and changes in empathy and attitudes toward interprofessional collaboration in osteopathic medical students. *Journal of American Osteopathic Association*, 113, 898–907.
- Chen, D., Lew, R., Hershman, W., & Orlander, J. (2007). A cross-sectional measurement of medical student empathy. *Journal of General Internal Medicine*, 22(10), 1434-8.
- Chen, D., Kirshenbaum, D. S., Yan, J., Kirshenbaum, E., & Aseltine, R. H. (2012). Characterizing changes in student empathy throughout medical school. *Medical Teacher*, 34, 305–311.
- Davis, M.H. (1983). Measuring individual differences in empathy: evidence for a multidimensional approach. *J Pers and Soc Psych*, 44, 113-26.
- Dental Society of Western Pennsylvania. (2018). Home. Pittsburgh, PA: Dental Society of Western Pennsylvania.

- DiLalla, L.F., Hull, S.K., Dorsey, J.K. (2008). Effect of gender, age, and relevant course work on attitudes toward empathy, patient spirituality, and physician wellness. *Teaching and Learning in Medicine*, 16(2), 165-70.
- Dillman, D.A. (2000). Mail and internet surveys: the tailored design method. 2nd edition. New York, NY: John Wiley and Sons Inc.
- Fjortoft, N., Van Winkle, L. J., & Hojat, M. (2011). Measuring empathy in pharmacy students. *American Journal of Pharmaceutical Education*, 75(6), Article 109.
- Fox, R.C. (1989). The sociology of medicine: a participant observer's view. Englewood Cliffs, NJ: Prentice-Hall.
- Gilligan, C. (1982). In a different voice: psychological theory and women's development. Cambridge, MA: Harvard University Press.
- Halpern, J. (2001). From detached concern to empathy: humanizing medical practice. New York, NY: Oxford University Press.
- Hogan, R. (1969). Development of an empathy scale. *Journal of Consulting and Clinical Psychology*, 33, 307-16.
- Hojat, M., Mangione, S., Nasca, T. J., Cohen, M. J. M., Gonnella, J. S., . . . Erdmann, J. B. (2001). The Jefferson Scale of Physician Empathy: development and preliminary psychometric data. *Educational and Psychological Measurement*, 61, 349–365.
- Hojat, M., Gonnella, J.S., Nasca, T.J., Mangione, S., Vergare, M., & Magee, M. (2002a). Physician empathy: definition, components, measurement, and relationship to gender and specialty. *Am J Psychiatry*, 159(9), 1563-9.
- Hojat, M., Gonnella, J. S., Nasca, T. J., Mangione, S., Veloski, J. J., & Magee, M. (2002b). The Jefferson Scale of Physician Empathy: further psychometric data and differences by gender and specialty at item level. *Academic Medicine*, 77, S58–S60.
- Hojat, M., Gonnella, J. S., Mangione, S., Nasca, T. J., Veloski, J. J., . . . Erdmann, J. B. (2002c). Empathy in medical students as related to academic performance, clinical competence and gender. *Medical Education*, 36, 522–527.
- Hojat, M., Gonnella, J.S., Mangione, S., Nasca, T.J., & Magee, M. (2003). Physician empathy in medical education and practice: experience with the Jefferson Scale of Physician Empathy. *Seminars in Integrated Medicine*, 1(1), 25-41.
- Hojat, M., Mangione, S., Nasca, T.J., Rattner, S., Erdmann, J.B., Gonnella, J.S., & Magee, M. (2004). An empirical study of decline in empathy in medical school. *Med Educ*, 38, 934-41.

- Hojat, M., Zuckerman, M., Gonnella, J. S., Mangione, S., Nasca, T., . . . Vergare, M. (2005). Empathy in medical students as related to specialty interest, personality, and perception of mother and father. *Personality and Individual Differences*, 39, 1205–1215.
- Hojat, M., Vergare, M.J., Maxwell, K., Brainard, G., Herrine, S.K., . . . Isenberg, G.A. (2009) The devil is in the third year: a longitudinal study of erosion of empathy in medical school. *Acad Med*, 84, 1182-91.
- Hojat, M. (2016). Empathy in health professions education and patient care. New York: Springer International.
- Hojat, M. (2016). Jefferson Scale of Physician Empathy Scoring Algorithm. Philadelphia: Thomas Jefferson University.
- Hojat, M., DeSantis, J., Shannon, S.C., Mortensen, L.H., Speicher, M.R., Bragan, L., LaNoue, M., & Calabrese, L.H. (2018). The Jefferson Scale of Empathy: a nationwide study of measurement properties, underlying components, latent variable structure, and national norms in medical students. *Adv in Health Sci Educ*, 23, 899-920.
- Kataoka, H. U., Koide, N., Hojat, M., & Gonnella, J. S. (2012). Measurement and correlates of empathy among female Japanese physicians. *BMC Medical Education*, 12, 48.
- Lieu, T.A., Schroeder, S.A., & Altman, D.F. (1989). Specialty choice at one medical school: recent trends and analysis of predictive factors. *Acad Med*, 64, 622–9.
- Mangione, S., Kane, G.C., Caruso, J.W., Gonnella, J.S., Nasca, T.J., & Hojat, M. (2002). Assessment of empathy in different years of internal medicine training. *Med Teach*, 24(4), 370-73.
- Mehrabian, A., & Epstein, N. (1972). A measure of emotional empathy. *Journal of Personality*, 40, 525-43.
- Nash, D.A. (2010). Ethics, empathy, and the education of dentists. *J of Dent Educ*, 74(6), 567–78.
- Newton, B.W., Savidge, M.A., . . . Barber, L. (2000). Differences in medical students' empathy. *Acad Med*, 75, 1215.
- Rosen, I.M., Gimotty, P.A., Shea, J., & Bellini, L. (2006). Evolution of sleep quantity, sleep deprivation, mood disturbances, empathy, and burnout among interns. *Acad Med*, 81(1), 82-5.
- Saleh, A., & Bista, K. (2017). Examining factors impacting online survey response rates in educational research: perceptions of graduate students. *Journal Of MultiDisciplinary Evaluation*, 13(29), 63-74.
- Sherman, J.J., & Cramer, B.S. (2005). Measurement of changes in empathy during dental school. *J Dent Edu*, 96(3), 338-45.

- Voinescu, B. I., Szentagotai, A., & Coogan, A. (2009). Residents' clinical empathy: gender and specialty comparisons—a Romanian study. *Acta Medica Academica*, 38, 11–15.
- Yarascavitch, C., Regehr, G., Hodges, B., & Haas, D.A. (2009). Changes in dental student empathy during training. *J Dent Educ*, 73, 509-517.